

ABSTRACT OF THE DISCLOSURE

The present invention discloses methods for manufacturing MTJ cell of MRAM wherein the surface of a pinned magnetic layer having a crystalline structure of long range order is physically impacted with heavy ions or atom to form an amorphous layer having a crystalline structure of short range order. In accordance with the method, a metal layer for connection layer and a pinned magnetic layer are formed. A surface of the pinned magnetic layer is physically impacted with atom to form an amorphous layer. A tunneling barrier layer, a free magnetic layer and a MTJ capping layer are sequentially formed and the MTJ capping layer, the free magnetic layer, the tunneling barrier layer, amorphous layer and the pinned magnetic layer are patterned using a MTJ cell mask to form a MTJ cell.